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F. H. P. REPAIR

Final Report

for

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F.H.P. Repair
For EMR, CANMET

1. INTRODUCTION

Due to continued processing problems with the Flash Hydrogen Pyrolysis unit presently situated at ORTECH International Pilot Plant premises a program was initiated through D.S.S. Contract 14SQ.23440-8-9001 to institute a thorough maintenance program. The object of this program was to identify leak areas make repairs and pressure and temperature test the apparatus to ensure the operational quality of the equipment.

2. WORK PROGRAM

The initial work program included a pressurising of the system with gas leak detection of all pipes, valves and joints. The system was pressurised to normal operating levels utilizing N_2. All minor joint leaks were repaired by resealing the joint. No major leaks were found in either lines or joints.

It was noted that some carbonaceous material could be detected in lines downstream from the reaction vessel, where detected this material was blown out or lines cleaned with an organic solvent.

Major leaks were discovered in 4 valves associated with the feed line to the preheater tube.

These valves were returned to the manufacturers for repair and recallibration prior to reintstallation to the cleaned and repaired circuit.

3. TESTING

3.1

The repaired unit was tested under nitrogen to 1000 p.s.i. for overnight static pressure test. Minor leaks were noted in the char trap head gasket and nitrogen source gang pigtail fittings. These leaks were eliminated and a subsequent overnight pressure test showed a 30 p.s.i.g. pressure drop. This is considered normal based on ambient pressure drops of 15°C. The F.H.P. unit was determined to be fully sealed at 1000 p.s.i.g. N_2 under static pressure.

3.2

Final testing was made under normal operating conditions. Utilizing 6000 p.s.i.g. H_2 gas, a dynamic pressure test was conducted at 800°C and 1850 p.s.i.g. H_2. Two minor operational problems were isolated and repairs affected.

The operation of the unit was considered fully successful, demonstrating dynamic pressure control at 1850 p.s.i.g. H_2, flow control at 10000, 12000, 17000 and 21000 L/min H_2.

Full furnace temperature control at 800°C and reactor H_2 pre-heat control at 25% allowable power was demonstrated.

Minor repairs which were made after test runs were to a H_2 regulator (standard laboratory equipment) and to one air operated valve.

4. CONCLUSIONS

All repairs to the F.H.P. equipment are now considered as complete. The unit is considered fully operational.

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